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MONTANA'S NATURAL GAS SITUATION AND MEAC'S
ENERGY CONVERSION POLICY STUDY



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Prepared for

The Citizen's Advisory Committee on Energy

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MONTANA'S NATURAL GAS SITUATION AND MEAC'S

ENERGY CONVERSION POLICY STUDY

One of the most complex aspects of dealing with the gasification question (should we select it as our alternative) is the placing of gasification in perspective with our actual natural gas situation and with the various alternatives available for our use. This brief paper has been prepared to provide a concise picture of our current natural gas situation, and to outline the various alternatives being examined under House Bill 453, in addition to the efforts of the Gasification Task Force.

Montana Natural Gas Situation

Industry Structure

Two major utility corporations supply most of the natural gas demand in Montana:

- The Montana Power Company which provides about 64% of total natural gas sales directly, with an additional 9% of sales distributed through other utilities, to the western two-thirds of the state.
- Montana-Dakota Utilities which provides the remaining one-third of the state with about 26% of total Montana natural gas sales.

In addition, nine other natural gas utilities distribute gas purchased from Montana Power, Montana-Dakota Utilities and other Montana producers. One additional company, Northern Natural Gas Company, has been primarily involved since 1972 in exportation of gas produced from the Tiger Ridge area in Blaine and Hill Counties to Minnesota.

Supply of Gas

The Montana Power Company system utilizes supplies of natural gas produced in two areas of Alberta as well as Montana gas production:

- The Carway fields in Southwestern Alberta for which existing contracts allow purchases of 29.2 billion cubic feet (bcf) per year. These contracts will begin expiring in 1985, with some remaining in effect until 1993.
- The Aden fields in Southeastern Alberta which have historically provided 18-20 bcf per year. Current permits allow exportation of 5 bcf from May 1976 through May 1977.

The import of Canadian natural gas began in 1952, increased steadily to an annual maximum of 50 bcf in 1973, and has decreased since then to 42.2 bcf in 1975. Canadian gas accounted for about 73% of total sales by the Montana Power Company in 1975. */ Production of natural gas in Montana by Montana Power has increased to almost 15 bcf during 1975. An additional 65 bcf of gas reserves will begin to supply the Montana Power system with 6 bcf per year, with the completion of the Lone Star Pipeline in the Fall of 1976.

Montana-Dakota Utilities draws on the natural gas resources of North Dakota, South Dakota, Wyoming and Montana for delivery in those states.

Production of natural gas in Montana, excluding the Tiger Ridge production which is mostly dedicated to export, decreased at an average rate of 5% per year from 1970 to 1975.

Consumption of Gas

Sales of natural gas in Montana are about 80 bcf per year (220 million cubic feet per day), representing about 30% of the fossil fuel energy consumed in the state. Total Montana sales of natural gas decreased by 3.9% from 1973 to 1974, but rose by 1.6% in 1975. Residential and commercial sales decreased by 4.0% from 1973 to 1974, but increased over 11% in 1975. Industrial sales decreased 9.3% from 1974 to 1975, accounting for about 42% of total sales in 1975. Approximately 76% of industrial natural gas sales in Montana are within the Montana Power system.

Prices

Prices for natural gas have increased dramatically in the past two years, particularly within the Montana Power system due to increases in the import

*/ Calculated as including sales for resale, excluding input from storage facilities.

price of Canadian gas. Since July 1, 1974, prices for Canadian natural gas have increased from 33 cents per thousand cubic feet (mcf) to \$1.60 per mcf. Recent announcements indicate that these prices may increase to \$1.80 per mcf in September, 1976, and then to \$1.94 per mcf in January, 1977. For comparison, recent contracts for purchases of Montana gas production have been made for about \$0.85 per mcf, and the price established by the Federal Power Commission for interstate sales of natural gas varies from \$0.51 to \$0.68 per mcf, depending on the total annual sales volume.

Recent Developments

The conversion from natural gas to alternate fuels by several Montana industries will significantly reduce Montana consumption. Conversion to coal by Great Western Sugar and Ideal Cement will save about 0.9 bcf per year and 2 bcf per year, respectively. Use of electricity in the Anaconda operation will also save about 2.5 bcf per year. Conservation plans developed by other industries within Montana, including the increased use of hog fuel in Western Montana, indicate that an additional 3.6 bcf of gas could be saved annually.

In spite of this, Montana-Dakota Utilities has announced that it may be necessary to curtail natural gas deliveries to industries during the 1976-77 heating season by as much as 22%.

1975 Montana Natural Gas Supply and Demand
(billion cubic feet at 14.73 psia)

Natural Gas Supply

Montana Production	44.5	33%
Imports, Total	69.1	51%
MDU Imports from Wyoming	23.4	
MDU Imports from N. Dakota	3.5	
MPC Imports from Canada	42.2	
Withdrawals from Montana Storage, Total	<u>22.1</u>	<u>16%</u>
MDU Storage Withdrawals	13.1	
MPC Storage Withdrawals	9.0	
TOTAL SUPPLY	<u>135.7</u>	<u>100%</u>

Natural Gas Disposition

Exports, Total	39.2	29%
MDU Exports to N. Dakota	11.0	
MDU Exports to S. Dakota	12.6	
MPC Exports to Canada	0.1	
Northern Natural Exports	15.5	
Injection to Montana Storage	13.1	10%
MDU Storage Injection	4.0	
MPC Storage Injection	9.1	
Montana Sales, Total	78.1	57%
Residential/Commercial	45.4	
Industrial	32.7	
Losses, Pipeline and Gas Company Use, and Unaccounted for Gas	<u>5.3</u>	<u>4%</u>
TOTAL DISPOSITION	<u>135.7</u>	<u>100%</u>

Energy Conversion Policy Study (House Bill 453)

House Bill 453 (Chapter No. 517, Montana Session Laws 1975) finds a lack of clearly defined state energy conversion objectives, policies and plans, and directs the Governor to prepare and submit to the next Legislature a "long-term, comprehensive state energy conversion policy and plan including but not limited to alternative long-term growth goals, a statewide siting inventory, and a proposed siting policy for the coordinated siting of energy conversion facilities to meet Montana's energy needs". In the statement of legislative findings and policy, the measure also says that these objectives, policies and plans must be subjected to citizen participation and review.

Subsequently, the Governor has assigned the implementation of House Bill 453 to the Montana Energy Advisory Council, and has directed MEAC to utilize the input of the Gasification Task Force in its efforts.

Administratively within the MEAC staff, the overall energy policy effort has been carved up into pieces with the responsibility for various components divided up among staff members. The specific objectives of the conversion policy component are (1) to consider the alternatives available to Montana in the conversion of energy from one form into another; (2) to discuss these alternatives and the implications of their use; and (3) to suggest appropriate policy actions. While related to the following, the conversion policy component does not consider in any comprehensive sense (1) extraction; (2) transportation; (3) conservation; (4) imports/exports; (5) facility siting; and (6) energy demand. These items are to be examined as other components of the overall energy policy effort.

In carrying out the conversion policy study, the following will be produced: (1) files and/or file reports; (2) background papers (may be published); (3) summary report on alternatives (will be published as part of the total energy policy project report); and (4) policy recommendations for the Governor and the Legislature. The strategy to accomplish this effort is to rely on contributed assistance (giving credit where it is due), to take full advantage of the massive literature available (while avoiding information overkill), and to capture financial and technical resources which can be directed to the project.

Fossil Energy

A large table has been prepared in draft form which presents such factors as thermal efficiency, energy and water inputs, material inputs, and employment for the following alternatives: (1) coal-fired steam power plant; (2) coal/solid waste steam power plant; (3) Lurgi low BTU gasification; (4) Lurgi high BTU gasification; (5) Koppers-Totzek methanol; (6) coal solvent refinery; and (7) H-Coal Process liquefaction. It also contains information on a surface coal mine, a uranium enrichment plant, and four energy transportation alternatives. In addition to this table, we are reviewing sources for information on the environmental effects of energy conversion processes, and for the preparation of brief technical descriptions of the major fossil conversion alternatives.

In the case of low BTU gasification of coal, we have written to every known supplier of such equipment in the country requesting pertinent information. Most have replied and we are now reviewing and summarizing this information. Commercial applications for low and medium BTU gasifiers include:

Electrical power generation.

- New combined cycle plants.
- Retrofit existing gas and oil plants.
- Produce methanol, gas turbine fuel.

Industrial.

- Fuel gas.
- Retrofit existing gas-and oil-fired equipment.
- Feed stock for production of chemicals (i.e., ammonia and methanol).

Natural gas utilities.

- Sale to large industrial customers.
- Produce fuel grade methanol.

In the category of direct burning of coal, there is definite potential for use in the industrial sector, although costs and air quality effects are not yet fully known. There are indications that the emerging fluidized bed process of coal combustion may be suitable for application in homes, providing a clean and convenient means of coal-fired home heat. Direct use of coal is being examined using assistance from MEMRDI, Montana Tech and others.

An analysis of the applicability of the production of synthetic liquid fuels from coal in Montana is being performed on contract for MEAC by a University of Montana researcher. This study is concentrating on a detailed description of the technology including process descriptions, resource requirements and environmental and social impacts. This study will also examine the economics of liquefaction technology and the applicability of liquefaction in Montana.

Oil refining is an important conversion activity which we can't ignore -- largely because we face a curtailment in our Canadian refinery feedstock supply very similar to our natural gas problem. Our major focus in refinery operations is in the examination of feedstock supply alternatives. We are working with the refineries and FEA on this matter.

Nuclear Energy

Both nuclear generation and uranium enrichment are being reviewed. The primary reason for concern is the massive external energy requirement to drive an enrichment plant. Coal-fired electrical generation could provide that energy. To our knowledge, there are no plans for either nuclear generation or uranium enrichment to occur in Montana.

Renewable Energy

The last major category of conversion alternatives is renewable energy. Our major activity in this area is in the writing of a citizen's handbook on renewable energy in Montana, which is in draft form now and will be published this summer. Our work to date indicates that Montana has solid potential in many renewable energy areas including: direct solar energy utilization, wind energy and wood; and definite promise in using solid waste as a boiler fuel and in other areas as well.

One of the most appealing factors about renewable energy applications is that they can often be successfully accomplished on a small scale. It is this potential for individual applications that has prompted our decision to publish the citizen's handbook.

What Next on the Conversion Policy?

As we wrap up the efforts mentioned above, we will be moving into a phase of considering policy actions including potential legislation and executive actions. Legislation can involve both substantive changes of statutes, as well as changes in funding priorities. Executive actions can cover a broad spectrum including directives to agencies, realignment of research and program priorities, public information and involvement, and so forth. We must involve the public in our conversion policy efforts. The Citizen's Advisory Committee on Energy is a natural means for this to be accomplished. Citizen feedback and constructive criticism can be very helpful in navigation of some troubled waters in Montana's energy history.

Some Related Activities

Phase I of MEAC's energy data project is nearing completion. Summary papers for our historical natural gas, petroleum, coal and electricity data are now out for review and comment. Upon completion of the review, these papers will be published under one cover for broad distribution. Much of the data will be automated for use in computerized analyses. It is our intention to examine the price/consumption relationship for various fuels, and to do other energy consumption and energy demand studies.

MEAC has contracted with a staff member in the Petroleum Engineering Department at Montana Tech to review existing information on natural gas reserves and resources in Montana and to advise us on the potential for additional natural gas and natural gas liquids production from Montana formations. This study will be completed in July.

